

REMARKS

This Amendment is being timely filed.

Applicants respectfully request the Examiner to reconsider the present application in view of the foregoing amendments to the claims and specification and the following remarks.

Status of the Claims

Claims 1-33 are pending. Claims 21 and 29 have been amended and claim 33 has been added. Claims 1-19 are withdrawn from consideration.

The amendments to claims 21 and 29 do not add new matter and are clearly clarifying and not narrowing in scope. By deleting/amending these terms in order to clarify the claimed invention, Applicants in no way are conceding any limitations with respect to the interpretation of the claims under the Doctrine of Equivalents.

New claim 33 has support in originally filed claims 20, 21, 23 and 25, and further has support throughout the specification including page 6, lines 31-33. No new matter has been added. Applicants note that new claim 33 falls within the elected subject matter.

The title of the present application has also been changed. No new matter has been added

Based upon the above considerations, entry of the present amendment is respectfully requested.

In view of the following remarks, Applicants respectfully request that the Examiner withdraw all rejections and allow the currently pending claims.

Amendment to the Specification

The title of the application has been amended in order to more clearly reflect the claimed invention (see paragraph 5, page 2 of the outstanding Office Action).

Issues Under 35 U.S.C. § 112, Second Paragraph

Claims 21 and 29 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite (see paragraphs 6-8 of the Office Action). Applicants respectfully traverse, and reconsideration and withdrawal of these rejections are respectfully requested.

Claims 21 and 29 have been amended herein to delete the recitation of “assuming that”. Thus, this rejection is rendered moot. Also, Applicants note that the claim scope of these claims remain the same since the claims still refer to I_a and I_b. Withdrawal of this rejection is respectfully requested.

Issues Under 35 U.S.C. § 102(e)

Claims 20, 21, 23, 25, 26, and 29-32 stand rejected under 35 U.S.C. § 102(e) based on U.S. Published Applic. No. 2003/10180619 (hereinafter referred to as “Tamura *et al.* ‘619”) (see paragraphs 9-10 of the Office Action). Applicants respectfully traverse.

First, Tamura *et al.* ‘619 is a U.S. application based on a PCT application (International No. PCT/JP01/08129) that published in the Japanese language. In other words, the national publication date of September 25, 2003 is the earliest effective prior art date of Tamura *et al.* ‘619. This prior art date is after the priority date (March 28, 2003) of Japanese Applic. No.

2003-089525, the priority document for the present application. Thus, the instant rejection is improper.

Still, regarding any possible date for Tamura *et al.* '619 under 35 U.S.C. § 102, including § 102(a) (as based on WO 02/25757, which is the international publication of Tamura *et al.* '619 and is a date that is prior to the priority date of the present application), Applicants respectfully submit the following remarks.

Tamura *et al.* '619 does not disclose all instantly claimed features. In summary, the “mixed layer of components of said current collector and thin alloy film” recited in claim 17 (at page 6) of Tamura *et al.* '619 does not have a function as instantly claimed. That is, Tamura *et al.* '619 fails to disclose the claimed feature of “protective layer for preventing a reaction between the active material layer and the collector” (see claim 20 of the present application). A more detailed explanation is provided below.

According to Tamura *et al.* '619, a thin alloy film is formed on a collector, followed by heat treatment or the like, whereby a mixed layer is formed (a film is described throughout the reference). Therefore, it is apparent to one of ordinary skill in the art that the mixed layer in Tamura *et al.* '619 is formed by the reaction between the collector and the thin alloy film. More specifically, in Tamura *et al.* '619, in the case of forming a mixed layer of components of a current collector and a thin alloy film on an interface between the collector and the thin alloy film, Tamura *et al.* is selecting a combination of a current component and an alloy component that react with each other. Further, in Tamura *et al.* '619, by allowing the collector and the thin alloy film to react with each other to form the above-mentioned mixed layer, an attempt is made by the Tamura *et al.* '619 reference to enhance the adhesion between the collector and the thin

alloy film. However, such a mixed layer does not prevent the reaction between an active material layer and a collector. Therefore, an active material layer and a collector react with each other gradually in Tamura *et al.* '619, which occurs during the progression of a charging/discharging cycle. This in turn degrades the characteristics of the Tamura *et al.* '619 electrode. Thus, Tamura *et al.* '619 fails to disclose all claimed features, including the claimed feature of the "protective layer for preventing a reaction between the active material layer and the collector".

Because "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," the cited Tamura *et al.* '619 reference cannot be a basis for a rejection under § 102. *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Reconsideration and withdrawal are respectfully requested.

Furthermore, the above-mentioned problem in Tamura *et al.* '619 is representative of Comparative Example 1 in the present application. More specifically, according to Comparative Example 1, a collector of a copper foil is plated with Sn, and a part of the collector is reacted with Sn by heat treatment to form an active material layer 5 having Cu_6Sn_5 (see page 14, lines 24-25). As shown in Figures 3 and 6 of the present application, a mixed layer 7 represented by Cu_3Sn is also formed on the interface between the active material layer and the collector (see page 14 of the specification; see also paragraph [0063] of the publication of the present application, which is US Published Applic. No. 2004/0219432 A1). When this negative electrode was subjected to a charging/discharging cycle 50 times, the thickness of the collector decreased by 14%, with the result that the characteristics of the electrode degraded (see page 16, starting at

line 4; see also paragraph [0070] in the published '432 application). This comparative example is representative of Tamura *et al.* '619.

Accordingly, one of ordinary skill in the art understands, upon reading the description of the present specification, that the mixed layer formed by the reaction between the collector and the thin alloy film in Tamura *et al.* '619 does not prevent the reaction between the active material layer and the collector. This is drawback that is found in the Tamura *et al.* '619 embodiment but not in the present invention.

Instead in the negative electrode in Example 1 of the present application in which a protective layer 2 preventing the reaction between the active material layer and the collector is formed, the thickness of the collector does not change before and after a charging/discharging cycle. Thus, the present specification contains experimental data showing that Tamura *et al.* '619 (via Comparative Example 1) does fail to disclose all claimed features. Also regarding such experimental data, the present invention achieves improved and excellent properties when compared to Tamura *et al.* '619 or Comparative Example 1 (see Table 1 of the present application at page 15).

Applicants also note the comments in the Office Action as to how the features of claims 21 and 29 are inherently found in Tamura *et al.* '619. Applicants do not concede this point. Further, this issue is rendered moot in view of the comments above.

As described above, the invention defined by the disputed claims of the present application is not the subject matter disclosed by Tamura *et al.* '619. Reconsideration and withdrawal of this rejection in view of Tamura *et al.* '619 are respectfully requested.

Issues Under 35 U.S.C. §102(b)

Claims 20-22 and 24-32 stand rejected under U.S.C. § 102(b) based on “Study on the anode behavior of Sn and Sn-Cu thin alloy film electrodes” (*Journal of Power Sources*, Vol. 107, pp. 48-55 (2002); hereinafter “Tamura *et al.* (2002)”) (see paragraph 11 of the Office Action). Applicants respectfully traverse, and reconsideration and withdrawal of this rejection are respectfully requested.

The “Cu-Sn-like phase first layer” in FIG. 8(b) of Tamura *et al.* (2002) does not correspond to the protective layer in claim 20 of the present application (all other claims ultimately depend on claim 20). More specifically, an electrode described in Tamura *et al.* is formed by plating a collector of a copper foil with Sn, and reacting a part of the collector with Sn by heat treatment. This is the same process as in the above-mentioned Comparative Example 1 in the present application. Further, the electrode described in Tamura *et al.* has a configuration wherein a Cu₃Sn layer is formed between a Cu₆Sn₅ layer and a Cu foil collector. This is also the same configuration as Comparative Example 1 discussed in the other § 102 rejection above in view of Tamura *et al.* ‘619.

Accordingly, as described above, the cited Tamura *et al.* (2002) reference does not disclose all features of the presently claimed invention (e.g., claim 20). Thus, under *Verdegaal Bros.*, this rejection has been overcome.

Again, Applicants also note the comments in the Office Action as to how the features of claims 21 and 29 are inherently found in Tamura *et al.* (2002). Applicants do not concede this point. Further, this issue is rendered moot in view of the comments above.

CONCLUSION

In view of the above amendment, applicant believes the pending application is in condition for allowance.

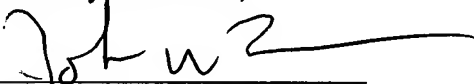
Applicants also request separate consideration of new claim 33.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Eugene T. Perez (Reg. No. 48,501) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

Dated: July 25, 2007

Respectfully submitted,

By 
John W. Bailey
Registration No.: 32,881
RCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road, Suite 100 East
P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000
Attorney for Applicant